

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRAInfo code (CA725)**

**Current Human Exposures Under Control**

**Facility Name:** U.S. Department of Energy - Knolls Atomic Power Laboratory  
**Facility Address:** 2401 River Road, Niskayuna, New York 12309  
**Facility EPA ID #:** NY6890008992

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X  If yes - check here and continue with #2 below.

     If no - re-evaluate existing data, or

     if data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e.,

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RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

**Site Background, Knolls Atomic Power Laboratory**

The Knolls Atomic Power Laboratory (hereafter referred to as “KAPL”) is located in the Town of Niskayuna, New York, approximately two miles east of the City of Schenectady. The facility consists of 170 acres situated on the southern bank of the Mohawk River. The river serves as the main watercourse for the Mohawk River Drainage Basin, which covers an area of 3456 square miles (Reference 1). Residential areas lie to the south of the KAPL facility. A separate research and development facility lies to the west, while a town park and closed municipal landfill lie to the east. Active site operations occur on the 60 westernmost acres of the property (“secure facility area”), which is completely surrounded by security fencing and is subject to 24-hour surveillance. The secure facility area is divided into what is known as the Upper Level, which is located on a bluff 115 to 120 feet above the Mohawk River surface, and the Lower Level, which is located to the north where the land surface slopes to a natural bench approximately 15 to 20 feet above the river surface. The remainder of the site to the east (“non-secure facility area”) consists of undeveloped woods and fields, and is routinely patrolled by facility security personnel.

KAPL’s principal function is research and development in the design and operation of naval nuclear power reactors. Laboratory research at the facility began in 1949. One of KAPL’s original missions was to develop a pilot process for the separation of radionuclides from irradiated nuclear fuel. Research on this process, conducted at the Separations Process Research Unit (“SPRU”) on-site, was completed in 1954. Since the completion of SPRU research, KAPL has been dedicated to the Naval Nuclear Propulsion Program.

Hazardous waste and mixed waste (containing both hazardous waste and radioactive waste) is generated from laboratory research and facility renovation activities, and is stored on-site within the secure facility area prior to shipment off-site. Storage of hazardous and mixed wastes is regulated via a Title 6 New York Code of Rules and Regulations (“NYCRR”) Part 373 Hazardous Waste Management Permit, issued by the New York State Department of Environmental Conservation (“NYSDEC”) on July 20, 1998 (Reference 2). Hereafter, this is referred to as “the Part 373 Permit.” The Part 373 Permit requires RCRA Corrective Action at specific areas where accidental contaminant release and managed waste disposal had occurred, coincident with the early years of facility operation.

There is currently no disposal of hazardous waste or mixed waste at the facility. Furthermore, there are no production wells for service water on-site (Reference 1). No known wells are used for domestic consumption in the vicinity of the site, since area residences are all served by a municipal water system (References 3 and 4).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

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<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

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	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	___	___	<u>VOCs</u>
Air (indoors) <sup>2</sup>	<u>X</u>	___	___	<u>Tetrachloroethylene</u>
Surface Soil (e.g., <2 ft)	<u>X</u>	___	___	<u>VOCs, SVOCs, metals, PCBs</u>
Surface Water	___	<u>X</u>	___	
Sediment	___	<u>X</u>	___	
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	<u>VOCs, SVOCs, metals, PCBs</u>
Air (outdoors)	___	<u>X</u>	___	

\_\_\_ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_ If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):** Various environmental investigations have been performed at different locations at the KAPL facility, pursuant to the requirements of the facility’s Part 373 Permit. The investigations were performed at areas where historical contamination is known or suspected to have occurred, and have confirmed that contamination exists at the facility above applicable regulatory standards and guidance values. These studies and their findings are summarized below.

**Land Disposal Area (“LDA”):** The Land Disposal Area, or LDA, consists of six Solid Waste Management Areas (“SWMUs”) either known or suspected to have received wastes during the early years of facility operations. These SWMUs lie within the eastern non-secure portion of the KAPL facility, and include: Former Landfill, Mercury Disposal Area, North Field, Pyrophoric Area, West Field, and Construction and Demolition Debris Area No. 1 (see attached map, “Knolls Site - Human Health Environmental Indicator SWMUs/AOCs,” hereafter referred to as “Knolls Site Map”). These SWMUs collectively comprise approximately 6.5 acres out of the 110-acre non-secure facility area. The non-secure area in which these SWMUs are located is undeveloped, and consists mostly of woods and fields. Information on wastes suspected at the LDA SWMUs, and approximate periods of operation, can be found in Reference 2.

**Soil:** Soil sampling within the LDA was conducted from July 2002 - October 2003 as part of the first phase RCRA Facility Assessment Sampling Visit (“RFA-SV”). Samples were analyzed for New York State

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<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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Superfund Contract Laboratory Package Target Compound List (“TCL”) organics and Target Analyte List (“TAL”) inorganics (metals), as appropriate to each area under study. Organic analytes included Volatile Organic Contaminants (“VOCs”), Semi-Volatile Organic Contaminants (“SVOCs”) and Polychlorinated Biphenyls (“PCBs”). Complete information on where contamination was detected, and at what concentrations, can be found in Reference 5.

During the RFA-SV, seventy-seven soil samples were taken from thirty-six borings installed within a 450 x 150 foot area, located north of the Pyrophoric Area (Knolls Site Map). The samples were analyzed for TCL VOCs, and were taken during the installation of thirty-three monitoring wells in an area of known VOC groundwater contamination. Tetrachloroethylene at levels exceeding the soil cleanup objective established by NYSDEC’s “Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, 1994” (“TAGM 4046”) was found in five soil samples taken from five borings. The maximum level for tetrachloroethylene was 43600 part per billion (ppb), as compared with the TAGM 4046 cleanup objective of 1400 ppb. This sample also yielded trichloroethylene at 2360 ppb, as compared with the TAGM 4046 cleanup objective of 700 ppb for this contaminant.

At the Construction and Demolition Debris Site Number 1 (Knolls Site Map), twenty-five soil samples were collected from eight locations within a 100 x 50 foot area, and analyzed for VOCs. The samples were taken from an area previously displaying VOCs in soil gas samples. Trichloroethylene exceeded the TAGM 4046 cleanup objective in four samples taken at three locations, to an estimated maximum of 40700 ppb. Monitoring well installation was attempted at this SWMU but was precluded by lack of saturated conditions.

At the Mercury Disposal Area, forty-five soil samples were collected from twenty soil borings to determine the effectiveness of previous remediation. This area was an unlined earthen pit (approximately 2 feet wide by 5 feet long by 4 feet deep) previously used by the facility for battery disposal. The pit was excavated in the early 1990s and contaminated soil and battery carcasses were removed. No VOCs, SVOCs or PCBs were discovered in excess of the soil cleanup objectives in TAGM 4046. Cyanide was detected in eighteen out of twenty-six samples, to a maximum level of 10.8 parts per million (ppm).

Levels of various toxic and other metals exceeded either TAGM 4046 cleanup objectives and/or statistically averaged LDA background levels. Table 1 below summarizes results for metals which are not directly attributable to natural site conditions.

**Table 1  
Mercury Disposal Area Soil Sampling Results (Metals)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/ Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration - parts per million (ppm)	TAGM 4046 Cleanup Objective/Averaged LDA Background (ppm)
aluminum	26/16	28600	SB/15200
antimony	33/20	1.12*	SB/0.29
barium	13/8	182	300 or SB/97.4

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Contaminant	Total Number of Samples Exceeding Cleanup Objectives/ Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration - parts per million (ppm)	TAGM 4046 Cleanup Objective/Averaged LDA Background (ppm)
beryllium	7/6	1.68	0.16 or SB/1.1
cadmium	15/12	0.652	1 or SB/0.3
chromium (total)	21/13	29.6	10 or SB/18.8
cobalt	6/5	21.8	30 or SB/14.4
lead	11/10	28	SB/15.7
mercury	13/8	0.831 **	0.1/0.09
selenium	22/17	0.9***	2 or SB/0.21
silver	7/6	0.421 ****	SB/0.09
vanadium	33/20	54.0*****	150 or SB/25.4
zinc	4/3	91.4	20 or SB/82.9

SB = Soil Background

\* estimated value, tentatively identified, found in sample blank

\*\* estimated value

\*\*\* found in blank

\*\*\*\* estimated value, found in blank

\*\*\*\*\* tentatively identified

With the exception of aluminum, beryllium and cobalt, the above results are lower than levels deemed by the New York State Department of Health (“NYSDOH”) to be protective of human health at the Building J7 Scrap and Salvage Unit, which is located within KAPL’s Lower Level. The latter unit is a 50 x 50 foot area investigated and remediated in 2002 as part of an Interim Corrective Measure (“ICM”) (Reference 6). Impact of metals’ levels found at the Mercury Disposal Area has yet to be evaluated.

Groundwater: As discussed above, a groundwater investigation was conducted from April 2002 - October 2003 at an area within the LDA north of the Pyrophoric Area (Knolls Site Map). From a total of thirty-two monitoring wells that were installed and sampled during the investigation, sixty groundwater samples were analyzed for TCL VOCs. Results in exceedence of Title 6 NYCRR Part 703.5 quality standards for potable groundwaters are summarized in Table 2 below. Complete information on where contamination was detected, and at what concentrations, can be found in Reference 7.

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**Table 2**  
**Land Disposal Area Groundwater Monitoring Results**

Contaminant	Total Number of Samples Exceeding Standards/Total Number of Wells where Standards were Exceeded	Maximum Concentration - parts per billion (ppb)	Part 703.5 Groundwater Standard (ppb)
benzene	1/1	1.1	1
cis-1,2-dichloroethylene	16/10	97.4	5
1,2-dichloroethane	6/3	36.3	0.6
trichloroethylene	25/14	641	5
toluene	1/1	7.6	5
tetrachloroethylene	27/14	5740	5
vinyl chloride	6/4	14.2	2

Information pertaining to the LDA groundwater investigation is summarized in the corresponding “Documentation of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750) - Migration of Contaminated Groundwater Under Control” that has been prepared for the KAPL facility.

Surface Water and Sediment: Two streams drain the northern and southern portions of the LDA, designated as the Midline Stream and the East Boundary Stream, respectively (Knolls Site Map). Sediment sampling of the Midline Stream was performed during the RFA-SV to augment previous VOC sampling of the stream’s surface water. No VOC contamination was discovered within this stream. Surface water sampling performed at the East Boundary Stream during the RFA-SV also revealed no VOC contamination (References 5 and 7).

Characterization of potential contamination at other SWMUs within the LDA is ongoing.

**Hillside Area:** The Hillside Area consists of the land areas adjacent to Buildings D3, D4, D6, G1, G2 and H2 within western portion of the secure facility area (Knolls Site Map). Contamination at Hillside has been traced to historical outdoor solvent drum storage and dispensing operations (Reference 4). The area is covered with either asphalt or concrete, with minor grassy areas occurring between roadways and buildings.

Pursuant to the Part 373 Permit, a phased RCRA Facility Investigation (“RFI”) was conducted at the Hillside Area from July 2001 - September 2003. The RFI included the collection of soil and groundwater samples for VOCs, and identified three distinct areas of contamination: 1) a 10 x 20 foot area west of Building D3/D6; 2) a 65 x 45 foot area within the Building G1/D4 alleyway, and; 3) an 80 x 60 foot area between Building G2 and H2. A smaller area of contamination was detected to the southwest of Building G2.

Soil: Of the two hundred and thirty soil (230) samples taken from fifty-one borings, thirty-seven samples

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exceeded TAGM 4046 cleanup objectives for various VOCs at twenty-two locations. The most prevalent contaminant was trichloroethylene, which exceeded the TAGM 4046 cleanup objective of 700 ppb in twenty-seven samples from sixteen borings, to a maximum level of 91500 ppb. Tetrachloroethylene exceeded the TAGM 4046 objective of 1400 ppb in nine samples taken from four borings, to a maximum of 27900 ppb. Each of the following contaminants were found to exceed the TAGM objectives in one sample only: chloroform, acetone, methylene chloride and trans-1,2-dichloroethylene. Complete information on where contamination was detected, and at what concentrations, can be found in Reference 5.

Groundwater: During the RFI, groundwater samples from twenty-seven newly-installed monitoring wells and one well point, plus four pre-existing wells, were analyzed for VOCs. The results of the groundwater sampling program are summarized in Table 3 below. Complete information on where contamination was detected, and at what concentrations, can be found in Reference 7.

**Table 3  
Hillside Area Groundwater Monitoring Results**

Contaminant	Total Number of Samples Exceeding Standards/Total Number of Wells Exceeding Standards	Maximum Concentration (ppb)	Part 703.5 Groundwater Standard (ppb)
carbon tetrachloride	6/3	5620	5
chloroform	7/4	4690	7
cis-1,2-dichloroethylene	25/17	648	5
trans-1,2-dichloroethylene	5/3	46.7	5
1,1-dichloroethane	1/1	7.6	5
1,1-dichloroethylene	1/1	9.8	5
methylene chloride	3/3	120*	5
tetrachloroethylene	7/5	22500*	5
trichloroethylene	25/17	21600	5
vinyl chloride	8/5	50.3	2

\* estimated result

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Information pertaining to the Hillside Area groundwater investigation is summarized in the corresponding "Documentation of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750) - Migration of Contaminated Groundwater Under Control" that has been prepared for the KAPL facility.

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Air: Due to the close proximity of buildings occupied by KAPL employees during business hours to VOC-contaminated areas within the Hillside Area, an indoor air quality/vapor intrusion study was performed from August 2004 - March 2005. The study was designed to assess the potential for vapor intrusion from subsurface sources of VOCs into occupied buildings, and whether this posed a risk to workplace personnel.

The first air sampling event was comprised of indoor, sub-slab and ambient air samples collected over a 24-hour duration on August 27 and 28, 2004. Indoor air and sub-slab air samples were both collected in Building D3 and in the basement of Building G1 (Knolls Site Map). Background air samples were collected outdoors and near each of the buildings. In the unoccupied G1 basement, air flow systems were operating. Building D3 samples were collected at a time when the area was unoccupied, and ventilation/air conditioning units were shut off.

Low concentrations of VOCs, primarily trichloroethylene and tetrachloroethylene, were detected in the indoor and sub-slab air samples in the G1 basement. For the D3 Building, the sub-slab concentration of tetrachloroethylene indicated the potential for vapor intrusion. Measured indoor air concentrations of tetrachloroethylene within Building D3 varied an order of magnitude between duplicate samples, and thus should be considered estimated due to duplicate uncertainty. However, since the duplicate sample displaying the higher of the two concentrations compounded the concern over potential vapor intrusion within Building D3, NYSDEC requested that KAPL perform additional sampling.

A second round of indoor samples were collected within Building D3 on October 16, 2004. To better represent potential vapor intrusion under typical workplace conditions, an indoor air sample and duplicate were collected over a 10-hour duration with the ventilation system operating. This time, duplicate results demonstrated good correlation, and indicated a 1-2 order of magnitude reduction in tetrachloroethylene levels compared to the first sampling round.

To verify the previous results under normal workplace ventilation conditions, as well as characterize indoor air during heating season conditions, a third round of air samples was collected on March 19, 2005 in Building D3 and Building G1. One indoor air sample was collected in Building D3; and one air sample was collected from each of the following Building G1 locations: basement sub-slab, basement, and first floor office (occupied space). The air samples were collected over a 10-hour duration with the ventilation systems operating in modes typical for the time of year. The sampling results corroborated the reduced concentrations of tetrachloroethylene seen in the previous sampling round.

Table 4 below lists the results for tetrachloroethylene and trichloroethylene for all three rounds of air sampling. Complete results and supporting data can be found in References 8 and 9.

**Table 4**  
**Hillside Area Air Monitoring Results**



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Sample Date and Location	Tetrachloroethylene		Trichloroethylene	
	Sub Slab (ug/m <sup>3</sup> )	Indoor Air (ug/m <sup>3</sup> )	Sub Slab (ug/m <sup>3</sup> )	Indoor Air (ug/m <sup>3</sup> )
<u>August 27-28, 2004</u>				
G1 Basement	220	36.5	2.6	<0.23
D3	44000	56*	346	0.54*
D3 Duplicate	-	376*	-	6.06*
<u>October 16, 2004</u>				
D3	-	7.1	-	1.5
D3 Duplicate	-	6.7	-	1.4
<u>March 19, 2005</u>				
G1 Basement	3.31	<1.03	1.91	<0.22
G1 First Floor	-	1.17	-	<0.22
G1 First Floor Duplicate	-	1.17*	-	<0.22
D3	-	18.8	-	0.38

ug/m<sup>3</sup> = micrograms per cubic meter

- = not analyzed

\* = estimated result

**High Yard Area:** The High Yard Area consists of an 80 x 88 foot area located in the center of the secure facility (Knolls Site Map). In addition to KAPL's perimeter security fence, access to the High Yard Area is further restricted by a separate locked chain link fence. Nearly ninety percent of the ground surface of the Yard is covered by asphalt and/or non-occupied buildings/switchgear equipment.

When fully operational, the former electrical High Yard was comprised of three oil-filled transformers, each with associated switchgear and load ratio controllers, five oil-filled circuit breakers, and appurtenant overhead and subsurface structures (Reference 10). PCBs found in soil are associated with historical leaks or spills most likely to have occurred prior to 1978. A Part 373 Permit-required RCRA Facility Investigation ("RFI") conducted from 1998-1999 revealed contamination by PCBs, VOCs, and SVOCs (Reference 11).

**Soil:** A total of three hundred and eighty-six soil (386) samples were taken from one hundred and thirty-seven (137) sampling locations and submitted for total PCB/Aroclor analysis. One hundred and twenty-six (126) of these samples, taken from fifty-four locations, exceeded the TAGM 4046 cleanup objective for surficial PCBs of 1 part per million (ppm). The maximum PCB concentration was 9000 ppm.

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Of the three hundred and twenty-eight (328) samples analyzed for VOCs, fifty samples from seventeen locations displayed VOCs in excess of TAGM 4046 cleanup objectives. Benzene exceeded the TAGM objective of 60 parts per billion (ppb) in two samples from one location, to a maximum of 140 ppb. Tetrachloroethylene exceeded the TAGM objective of 1400 ppb in thirty samples from twelve locations, to an estimated maximum of 290,000 ppb. Trichloroethylene exceeded the TAGM objective of 700 ppb in thirty-three samples from fourteen locations, to an estimated maximum of 45000 ppb. Xylenes exceeded the TAGM objective of 1200 ppb in six samples at three locations, to a maximum of 4400 ppb. Trans-1,2-dichloroethylene exceeded the TAGM objective of 300 ppb in one sample (530 ppb).

Of the ninety-four samples analyzed for SVOCs, eleven were found to exceed TAGM 4046 cleanup objectives for SVOCs. 1,4-dichlorobenzene was detected in one sample at an estimated value of 8600 ppb, slightly above the TAGM level of 8500 ppb. 1,2,4-trichlorobenzene exceeded the TAGM objective of 3400 ppb in eight samples from three locations, to an estimated maximum of 210,000 ppb. Benzo(a)pyrene exceeded the TAGM objective of 61 ppb in three samples at two locations, to an estimated maximum of 150 ppb. Dibenzo(a,h)anthracene was detected in one sample at an estimated value of 140 ppb, as compared with the TAGM objective of 14 ppb.

Complete information on where contamination was detected, and at what concentrations, can be found in Reference 11.

Groundwater: Eleven samples from nine wells were analyzed for VOCs. Cis-1,2-dichloroethylene exceeded the Part 703.5 quality standard of 5 ppb in two samples from two wells, to a maximum of 22 ppb. Trans-1,2-dichloroethylene was found in one sample at 9.8 ppb, as compared with the standard of 5 ppb. Tetrachloroethylene exceeded the standard of 5 ppb in two samples taken from one well, to a maximum of 7.7 ppb.

A single estimated PCB result of 0.22 ppb, as compared with the standard of 0.09 ppb, is considered suspect since it was found in a highly turbid sample from a wellpoint placed within an area of PCB-contaminated soils. PCBs were not detected in any of the other wells within the contaminated area.

Further information on the results of the High Yard Area groundwater investigation can be found in the corresponding "Documentation of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750) - Migration of Contaminated Groundwater Under Control" that has been prepared for the KAPL facility, and also in References 10 and 11.

**Separations Process Research Unit ("SPRU")**: SPRU was operated from the late 1940s to the early 1950s at KAPL in two Upper Level buildings (G2 and H2, Knolls Site Map). The function of SPRU was to develop and refine a process for the extraction of useful radionuclides from irradiated nuclear fuel. The work was done on a laboratory scale and never on a production level. Test quantities of fuel were dissolved in acids and treated with various chemicals to separate the radionuclides. SPRU research was concluded in 1954. During the next several years, substantial effort was devoted to shipping staged SPRU wastes for off-site disposal. By the mid-1960s, most of the SPRU wastes had been removed from KAPL.

The SPRU RCRA Facility Sampling Visit ("RFA-SV") covers eight Solid Waste Management Units ("SWMUs") and one Area of Concern ("AOC") located within three separate areas at the KAPL site. The SWMUs and AOC are related to SPRU because they received waste materials associated with or generated at SPRU. The Upper Level SWMUs (H2 Processing Facility, H2 Tank Farm, Pipe Tunnels - Knolls Site Map) comprise a 200 x 150 foot investigation area around Buildings H2 and G2. This area is located in the

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northern portion of the bluff along the northwestern perimeter of KAPL's upper level facility area, and is covered mostly by concrete and asphalt. The area surrounding Building H2 is covered by gravel overlying an impermeable geomembrane to the east, west, and north. Waste and wastewater processing took place within H2, while the adjacent sub-grade tank farm was used to store process separations material and waste. Waste was transported via pipe tunnels located within vaults between Buildings G2/G1/E1 and H2.

The Lower Level SWMUs/AOC (K6 Storage Pad, K7 Storage Pad, Railroad Staging Area, K5 Retention Basin, Lower Level Parking Lot - Knolls Site Map) comprise a 1400-foot section extending along the parking lot and old railroad spur between the Lower Level facility area and the hill slope rising up to KAPL's upper level. The eastern portion of the Lower Level SWMUs/AOC area is primarily grassy surface with asphalt roadways bisecting the area along the east-west and north-south axes. The western portion of the Lower Level SWMUs/AOC consists of an asphalt parking lot. The storage pads and railroad staging area were used for above-ground storage of containerized SPRU wastes. The parking lot received fill material from the railroad staging area and storage pads. The retention basin was used for containment of non-hazardous process wastewater and laundry wastewater.

The one SWMU associated with SPRU which is located within the eastern, non-secure facility area (Former Slurry Drum Storage Area - Knolls Site Map) is bounded by the East Boundary and Midline Stream drainages. This SWMU was a 30 x 30 foot earthen bermed area used for above-ground staging of containerized wastes from SPRU. The berm was bulldozed and graded in the mid-1950s. The outer perimeter of this area is partially wooded along the eastern, northern, and western perimeter, with grass and brush comprising the non-wooded areas (Reference 12).

Soil: Soil samples taken at the SPRU SWMUs were analyzed for TCL VOCs, SVOCs and TAL metals. At the Upper Level, twenty-three samples from eleven borings were analyzed for VOCs, and yielded no results above the TAGM 4046 cleanup objectives. Forty-three samples from eleven borings were analyzed for SVOCs, resulting in exceedences of the TAGM 4046 cleanup objectives in thirteen samples taken from nine borings. The elevated SVOC levels in the soil column often coincided with the presence of cinders and slag-like material that were used as backfill during SPRU construction. The results of the Upper Level SVOC sampling program are summarized in Table 5 below.

**Table 5  
SPRU Upper Level Soil Sampling Results (SVOCs)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppb)	TAGM 4046 Cleanup Objective (ppb)
benzo(a)anthracene	9/9	51300	224
benzo(a)pyrene	13/9	40500	61
benzo(b)fluoranthene	3/3	43600	1100
benzo(k)fluoranthene	3/3	12000	1100

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Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppb)	TAGM 4046 Cleanup Objective (ppb)
chrysene	5/5	36000*	400
dibenz(a,h)anthracene	2/2	1500*	14
fluoranthene	1/1	110000	50000
indeno(1,2,3-c,d)pyrene	2/2	19800*	3200
phenanthrene	1/1	99700	50000
pyrene	1/1	75000	50000

\* estimated result

At the Upper Level, forty-three samples from eleven borings were analyzed for metals, resulting in exceedences of either the TAGM 4046 cleanup objectives or of statistically averaged background levels from the LDA. Table 6 below summarizes sampling results for metals not directly attributable to natural conditions or road-salting applications.

**Table 6  
SPRU Upper Level Soil Sampling Results (Metals)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppm)	TAGM 4046 Cleanup Objective/ Averaged LDA Background (ppm)
antimony	6/4	0.78*	SB/0.29
arsenic	1/1	25.2	7.5 or SB/8.8
barium	3/3	179	300 or SB/97.4
cadmium	5/4	0.75	1 or SB/0.3
chromium (total)	6/4	26.2	10 or SB/18.8
lead	4/4	45.7	SB/15.7
mercury	4/4	0.31	0.1/0.09

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Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppm)	TAGM 4046 Cleanup Objective/Averaged LDA Background (ppm)
selenium	7/4	1.61	2 or SB/0.21
vanadium	5/3	56.7	150 or SB/25.4
zinc	4/4	357*	20 or SB/82.9

SB = Soil Background

\* estimated result

At the Lower Level, one hundred and twenty-three (123) samples were taken from one hundred and one (101) borings and one trench and analyzed for VOCs. No VOCs were detected above TAGM 4046 cleanup objectives. A total of two hundred and sixty-four (264) samples taken from one hundred and three (103) borings and one trench were analyzed for SVOCs. Many of the contaminated samples were taken from areas where remnants of railroad ballast (including ash, cinders and coal) were present. The results are summarized in Table 7 below.

**Table 7  
SPRU Lower Level Soil Sampling Results (SVOCs)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppb)	TAGM 4046 Cleanup Objective (ppb)
benzo(a)anthracene	15/14	6000*	224
benzo(a)pyrene	24/23	4900*	61
benzo(b)fluoranthene	6/6	3800*	1100
benzo(k)fluoranthene	6/6	4400*	1100
chrysene	15/14	5300	400
dibenz(a,h)anthracene	9/8	930*	14
phenol	1/1	75*	30

\* estimated result

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At the Lower Level, two hundred and sixty-four (264) samples from one hundred and three (103) borings and one trench were analyzed for metals, resulting in exceedences of either the TAGM 4046 cleanup objectives or of statistically averaged background levels from the LDA. Table 8 below summarizes sampling results for metals not directly attributable to natural conditions or road-salting applications.

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**Table 8  
SPRU Lower Level Soil Sampling Results (Metals)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppm)	TAGM 4046 Cleanup Objective/Averaged LDA Background (ppm)
aluminum	20/14	17800	SB/15200
antimony	25/20	1.3*	SB/0.29
arsenic	54/43	75	7.5 or SB/8.8
barium	24/18	212	300 or SB/97.4
beryllium	1/1	1.4	0.16 or SB/1.1
cadmium	23/17	1.2	1 or SB/0.3
chromium (total)	51/33	45.6	10 or SB/18.8
cobalt	42/31	30.6	30 or SB/14.4
copper	31/27	111	25 or SB/38.1
lead	87/65	90.8	SB/15.7
mercury	27/22	6.9*	0.1/0.09
nickel	21/16	47*	13 or SB/33.8
selenium	57/30	1.27	2 or SB/0.21
silver	13/13	1.1	SB/0.09
thallium	28/23	1.08*	SB/0.26
vanadium	52/38	178	150 or SB/25.4
zinc	32/25	270	20 or SB/82.9

SB = Soil Background

\* estimated result

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At the Former Slurry Drum Storage Area within the LDA, samples were taken in and around the footprint of the former container storage area, and from areas where soil from the former berm may have been graded. In addition, debris found in several of the borings indicated that the SPRU sampling program had extended into the Former Landfill, which is one of the LDA Solid Waste Management Units (Knolls Site Map). As

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part of the program, sixty-five soil samples were collected from fifty-five soil borings and analyzed for VOCs. No VOC concentrations exceeded TAGM 4046 cleanup objectives. SVOCs were analyzed in thirty-one samples taken from twenty-three borings. Benzo(a)pyrene exceeded the TAGM 4046 cleanup objective of 61 ppb in five samples from five borings, to an estimated maximum of 1000 ppb. Benzo(a)anthracene exceeded the TAGM 4046 objective of 224 ppb in two samples from two locations, to an estimated maximum of 1300 ppb. Chrysene was found in two samples to an estimated maximum value of 1400 ppb, in comparison with the TAGM 4046 objective of 400 ppb. Asphalt-impregnated paper was historically used to cover soil during excavations in this area.

Metals' analysis was conducted on one hundred and thirty-two (132) samples from fifty-five soil borings, resulting in exceedences of either the TAGM 4046 cleanup objectives or statistically averaged background levels from the LDA. Table 9 below summarizes the results of the sampling program for metals not directly attributable to natural site conditions.

**Table 9  
Former Slurry Drum Storage Area Sampling Results (Metals)**

Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppm)	TAGM 4046 Cleanup Objective/ Averaged LDA Background (ppm)
aluminum	6/6	19900	SB/15200
antimony	2/2	0.36*	SB/0.29
arsenic	5/5	13.7	7.5 or SB/8.8
barium	9/9	176	300 or SB/97.4
beryllium	2/2	1.2	0.16 or SB/1.1
cadmium	6/5	0.67	1 or SB/0.3
chromium (total)	8/8	25.2	10 or SB/18.8
cobalt	7/7	20	30 or SB/14.4
copper	4/3	109*	25 or SB/38.1
lead	9/9	189*	SB/15.7
mercury	5/4	0.32	0.1/0.09
nickel	6/6	132	13 or SB/33.8
selenium	6/6	0.39*	2 or SB/0.21
silver	7/5	0.6	SB/0.09



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Contaminant	Total Number of Samples Exceeding Cleanup Objectives/Total Number of Soil Borings where Cleanup Objectives were Exceeded	Maximum Concentration (ppm)	TAGM 4046 Cleanup Objective/Averaged LDA Background (ppm)
thallium	3/3	0.3*	SB/0.26
vanadium	9/9	36.1	150 or SB/25.4
zinc	6/5	124*	20 or SB/82.9

SB = Soil Background

\* estimated result

Elevated results for antimony, arsenic, copper, and lead occur particularly along the former railroad spur. However, with the exception of aluminum, arsenic, cobalt and mercury, the metals' results for SPRU soils at the Upper Level, Lower Level and Former Slurry Drum Storage Area are lower than levels deemed by NYSDOH to be protective of human health at KAPL's J7 Scrap and Salvage Unit, which was discussed above in reference to the Mercury Disposal Area (LDA). Impact of the metals' results at the SPRU SWMUs has yet to be evaluated.

Groundwater: Monitoring wells installed at both the Upper and Lower Levels were sampled for VOCs, SVOCs and metals. At the Upper Level SPRU SWMUs, groundwater samples were collected from three pre-existing monitoring wells in the vicinity of Building H2 and the adjacent sub-grade tank vault, six pre-existing cased borings circumscribing Building H2, and four newly-installed monitoring wells located adjacent to the pipe tunnels between Buildings H2 and G2. No SVOCs were detected above groundwater quality criteria from these data points or from eight pre-existing monitoring wells nearby. VOCs were detected in only one of the pipe tunnel wells, which is in an area found during the Hillside Area RFI to be contaminated by chlorinated VOCs. Total 1,2-dichloroethylene was detected at 7 ppb within this well, as was trichloroethylene at 18 ppb.

Dissolved antimony was detected in two of the Building H2 cased borings at levels slightly exceeding the Part 703.5 standard of 3 ppb. The cased borings lack screens and therefore may exhibit a turbidity/elevated metal effect during sampling events.

Of four monitoring wells installed along the Lower Level, phenol was detected at an estimated value of 2 ppb, slightly above its Part 703.5 standard of 1 ppb. The duplicate sample displayed phenol at the groundwater standard. This well was installed in an area where evidence of railroad ballast was found in the soil column. A pre-existing monitoring well sampled along the Lower Level during the SPRU-SV also yielded an estimated value of 8 ppb of phenol. This well has not displayed phenol in excess of the Part 703.5 quality standard in past annual sampling by KAPL.

Groundwater monitoring wells could not be installed at the Former Slurry Drum Storage Area, due to lack of saturated conditions.

Data collected to date do not indicate a significant or widespread problem in groundwater associated with the SPRU-associated SWMUs. Complete information on where contamination was detected, and at what concentrations, can be found in Reference 12. Characterization of potential contamination at these areas is

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ongoing.

3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

<b>“Contaminated” Media</b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	<u>NA</u>	<u>No</u>	<u>NA</u>	<u>No</u>			<u>No</u>
Air (indoors)	<u>NA</u>	<u>No</u>	<u>NA</u>				
Soil (surface, e.g., <2 ft)	<u>NA</u>	<u>No</u>	<u>NA</u>	<u>No</u>	<u>No</u>	<u>NA</u>	<u>No</u>
<del>Surface Water</del>	<u>NA</u>	<u>NA</u>			<u>NA</u>	<u>NA</u>	<u>NA</u>
<del>Sediment</del>	<u>NA</u>	<u>NA</u>			<u>NA</u>	<u>NA</u>	<u>NA</u>
Soil (subsurface e.g., >2 ft)				<u>No</u>			<u>No</u>
Air (outdoors)	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated”) as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“\_\_\_”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- X If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- \_\_\_\_\_ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- \_\_\_\_\_ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

Rationale and Reference(s): There are no full-time residents on-site, nor are there day-care or recreational facilities. Therefore, these routes of exposure are not applicable to the KAPL facility. Surface water,

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<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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sediment and outdoor air have not displayed contamination above standards or guidance criteria.

Groundwater: There is no on-site groundwater usage, and the migration of contaminated site groundwater is under control. A municipal water system provides water to the site and nearby residences. Therefore, workers are not affected. There is no crop, meat or dairy production in the vicinity of the facility. Groundwater contamination is under control and does not affect the quality of the adjacent Mohawk River, hence preventing human exposure to contamination in site groundwater via consumption of fish taken from the river.

Air: Based on the sampling results described above and listed within Table 4, NYSDEC and NYSDOH have concluded that, per current NYSDOH guidelines, the existing data indicate that vapor intrusion is not an exposure pathway of concern at the Hillside Area, under normal workplace conditions/ventilation configurations. KAPL will conduct annual air monitoring to determine whether any changes in these conditions occur.

Soil: Soil contaminants are largely associated with subsurface soils, and there are no open or active burial areas. Where surface soils are affected, protection from exposure is provided by established vegetation or asphalt/concrete structures. In addition, the site is not open to the public. Trespassing is controlled through site access security measures in the active portion of the facility (perimeter security fencing, guard stations), and a combination of routine surveillance/patrolling measures and topographic/natural barriers in the remainder of the site. Employees and contractors are further protected from exposure to soil contaminants through the use of local controls that require Environment, Health and Safety personnel review and approval, prior to commencing any soil disturbance activities.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)? **NA**

\_\_\_\_\_ If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

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<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and

Reference(s): \_\_\_\_\_

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits? **NA**



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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

- YE** - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **U.S. Department of Energy, Schenectady Naval Reactors, Knolls Atomic Power Laboratory** facility, EPA ID # **NY6890008992**, located at **2401 River Road, Niskayuna, New York** under current and reasonably expected conditions. This determination represents the best understanding of conditions at the afore-mentioned facility by the Agency/State, given the most current data. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.
- NO** - "Current Human Exposures" are NOT "Under Control."
- IN** - More information is needed to make a determination.

Completed by (signature) \_\_\_\_\_ Date \_\_\_\_\_  
(print) Margaret Rogers  
(title) Engineering Geologist II

Supervisor (signature) \_\_\_\_\_ Date \_\_\_\_\_  
(print) Clifton J. Van Guilder, P.E.  
(title) Regional Solid & Hazardous Materials Engineer  
(EPA Region or State) NYSDEC Region 4

NYSDEC  
Central Office (signature) \_\_\_\_\_ Date \_\_\_\_\_  
(print) Edwin Dassatti, P.E.  
(title) Director, Bureau of Hazardous Waste  
and Radiation Management  
(EPA Region or State) NYSDEC Central Office

References:

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1. Knolls Atomic Power Laboratory, 2003. *Environmental Monitoring Report, Calendar Year 2003*. KAPL-4851.
2. New York State Department of Environmental Conservation, 1998. *NYSDEC 6 NYCRR Part 373 Hazardous Waste Management Facility Permit for the U. S. Department of Energy Knolls Atomic Power Laboratory, Knolls Site, Niskayuna, New York*. EPA I.D. Number: NY6890008992, NYSDEC Permit Number: 4-4224-00024/00001.
3. General Electric Company, Knolls Atomic Power Laboratory, Schenectady, New York, 1991. *Memo to File, R. Curley (GE) to J. Verbige (Niskayuna Water Department)*, September 23, 1991.
4. Knolls Atomic Power Laboratory, 2002. *Knolls Site Environmental Summary Report*, August 2002, KAPL-4847.
5. Knolls Atomic Power Laboratory, 2004. *Knolls Atomic Power Laboratory, Knolls Site - Environmental Indicator Current Human Exposures Under Control (CA725), Supporting Information*. August 13, 2004.
6. Knolls Atomic Power Laboratory, 2002. *J7 Scrap & Salvage RCRA Facility Investigation Report and RFI Summary Report*, May 30, 2002. (Approved by NYSDEC 6/02).
7. Knolls Atomic Power Laboratory, 2004. *Knolls Atomic Power Laboratory, Knolls Site - Environmental Indicator Migration of Groundwater Under Control (CA750), Supporting Information*. July 16, 2004.
8. Knolls Atomic Power Laboratory, 2005. *Environmental Indicator Current Human Exposures Under Control (CA725); Transmittal of Validated Data for the Hillside Area RCRA Facility Investigation Indoor Air Quality Assessment*. January 2005.
9. Knolls Atomic Power Laboratory, 2005. *Environmental Indicator Current Human Exposures Under Control (CA725); Hillside Area RCRA Facility Investigation Indoor Air Quality Assessment Validated March 2005 Data*. May 2005.
10. Knolls Atomic Power Laboratory, 2004. *Supplemental Groundwater Characterization Report for the High Yard Area (SWMU-023), Knolls Atomic Power Laboratory, Niskayuna, New York*. February 2004. (Accepted by NYSDEC 6/04).
11. Knolls Atomic Power Laboratory, 2000. *RCRA Facility Investigation Report for the High Yard Area, Knolls Atomic Power Laboratory, Niskayuna, New York*. August 2000. (Approved by NYSDEC 4/01).
12. Knolls Atomic Power Laboratory, 2002. *RCRA Facility Assessment Sampling Visit Report for the Separations Process Research Unit SWMUs/AOC, Knolls Atomic Power Laboratory, Niskayuna, New York*. February 2002. (Draft).

Locations where References may be found:

New York State Department of Environmental Conservation  
Region 4  
Division of Solid & Hazardous Materials  
1150 North Westcott Road

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Schenectady, NY 12306



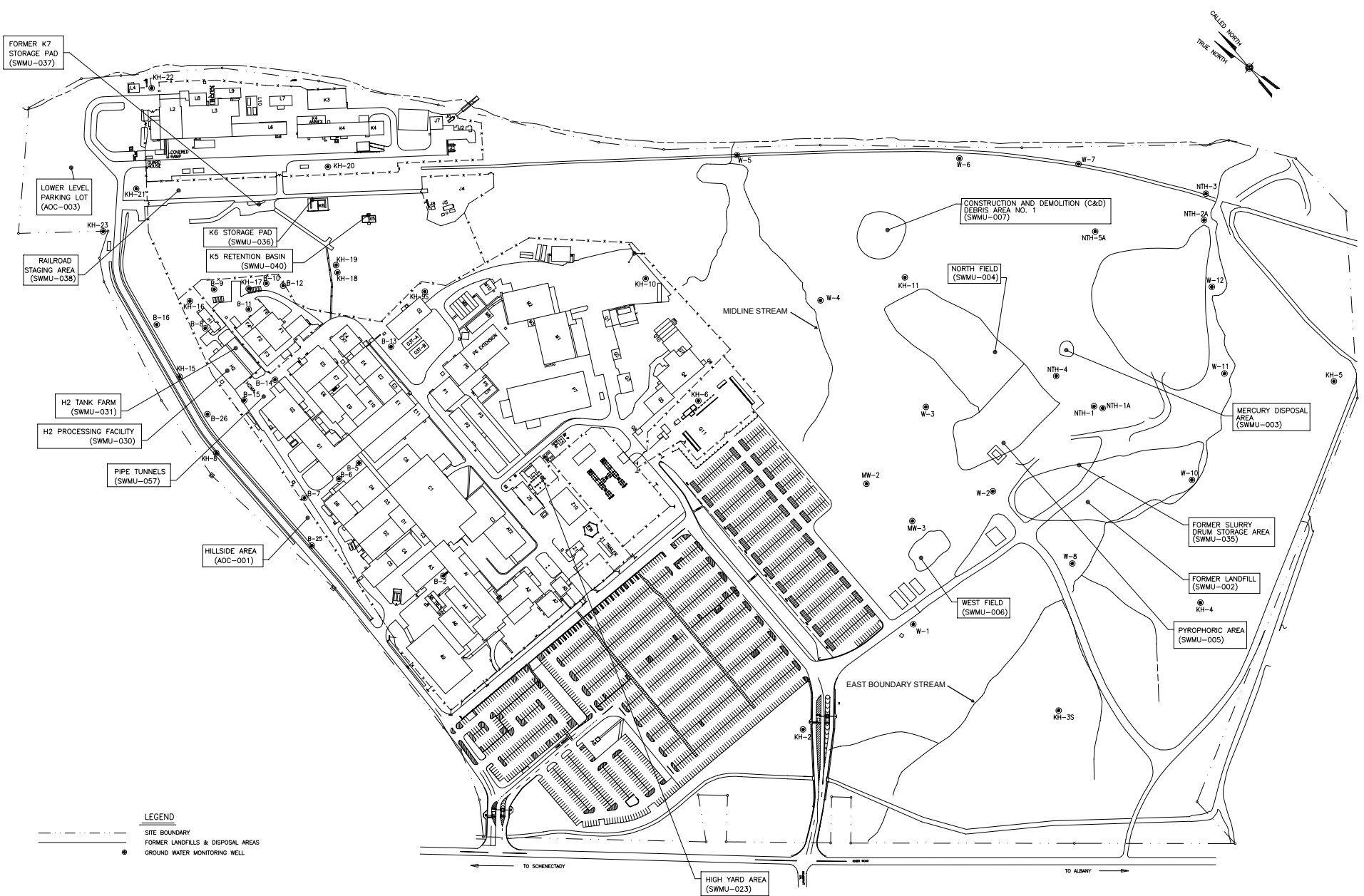
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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**



KNOLLS SITE  
 HUMAN HEALTH ENVIRONMENTAL INDICATOR SWMUs/AOCs